

IN THE CLAIMS:

Claims 1 - 26 (**canceled**).

1           27. (**NEW**): A method of imaging a portion of the aorta of a patient using a  
2           magnetic resonance imaging system, the method comprising:  
3           determining an arrival time of a test bolus in a region of interest;  
4           correlating an administration of a magnetic resonance contrast agent with an  
5           acquisition of magnetic resonance image data, including image data which is  
6           representative of the center of k-space, using the arrival time of the test bolus;  
7           administering the magnetic resonance contrast agent to the patient; and  
8           acquiring the magnetic resonance image data using a 3D pulse sequence,  
9           wherein the image data which is representative of the center of k-space is acquired  
10          while the concentration of the contrast agent in the portion of the aorta is greater  
11          than a concentration of the contrast agent in veins and background tissue adjacent  
12          to the portion of the aorta.

1           28. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance  
2           image data further includes using a flip angle which is greater than about 30° and  
3           less than or equal to about 90°.

1           29. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance  
2           image data further includes using a TR which is less than about 10 milliseconds and  
3           a TE which is less than about 3 milliseconds.

1           30. **(NEW)**: The method of claim 27 wherein acquiring magnetic resonance  
2 image data further includes acquiring a substantial portion of the image data which  
3 is representative of the central portion of k-space while the patient suspends  
4 respiration.

1           31. **(NEW)**: The method of claim 27 further including correlating the  
2 acquisition of the image data which is representative of the center of k-space with  
3 the suspension of respiration by the patient.

1           32. **(NEW)**: The method of claim 27 further including imaging at least one  
2 renal artery of the patient by acquiring magnetic resonance image data, of a  
3 coronally oriented image volume including the renal artery wherein the image data  
4 being acquired while the concentration of the contrast agent in the renal artery is  
5 substantially greater than a concentration of the contrast agent in veins and  
6 background tissue adjacent to the artery.

1           33. **(NEW)**: The method of claim 27 further including imaging at least one  
2 renal artery of the patient by acquiring magnetic resonance image data including  
3 image data which is representative of the center of k-space while the concentration  
4 of the contrast agent in the renal artery is substantially greater than a concentration  
5 of the contrast agent in veins and background tissue adjacent to the artery.

1           34. **(NEW)**: The method of claim 34 wherein imaging at least one renal  
2 artery of the patient further includes collecting 3D phase contrast images.

1           35. **(NEW)**: The method of claim 27 wherein the image volume of the 3D  
2 pulse sequence includes at least one dimension which is greater than 25 cm.

1           36. **(NEW)**: The method of claim 27 further including:  
2           collecting image data of a pre-contrast image data set including collecting  
3 image data before administering a substantial amount of the magnetic resonance  
4 contrast agent to the patient; and  
5           constructing an image of the portion of the aorta by subtracting the image  
6 data of the pre-contrast image data set from the image data acquired while the  
7 concentration of the contrast agent in the portion of the aorta is greater than a  
8 concentration of the contrast agent in veins and background tissue adjacent to the  
9 portion of the aorta.

1           37. **(NEW)**: The method of claim 27 further including acquiring image data  
2 of the periphery of k-space while the concentration of the contrast agent in the aorta  
3 is greater than a concentration of the contrast agent in veins and background tissue  
4 adjacent to the aorta.

1           38. **(NEW)**: A method of imaging an artery of a patient using a magnetic  
2 resonance imaging system, the method comprising:  
3           determining an arrival time of a magnetic resonance contrast agent in a  
4 region of interest wherein the region of interest includes the artery;

5 correlating an injection of the magnetic resonance contrast agent to the  
6 patient with a collection of magnetic resonance image data using the arrival time of  
7 the magnetic resonance contrast agent in the region of interest;

8 injecting the magnetic resonance contrast agent to the patient; and

9 collecting the magnetic resonance image data using a 3D pulse sequence,  
10 wherein collecting magnetic resonance image data includes collecting a substantial  
11 portion of the image data while the concentration of the contrast agent in the artery  
12 is greater than a concentration of the contrast agent in veins and background tissue  
13 adjacent to the artery.

1 39. **(NEW)**: The method of claim 38 wherein the arrival time of the magnetic  
2 resonance contrast agent is an estimated arrival time.

1 40. **(NEW)**: The method of claim 38 further including correlating collection of  
2 magnetic resonance image data which is representative of the center of k-space  
3 with the arrival time of the contrast agent in the region of interest.

1 41. **(NEW)**: The method of claim 38 wherein determining the arrival time of  
2 a magnetic resonance contrast agent in the region of interest includes using a test  
3 bolus.

1 42. **(NEW)**: The method of claim 38 further including correlating the  
2 suspension of the respiration of the patient with the collecting magnetic resonance  
3 image data.

1           43. **(NEW)**: The method of claim 42 wherein correlating the suspension of  
2           the respiration of the patient with the collecting magnetic resonance image data  
3           includes collecting a substantial portion of the image data which is representative of  
4           the center of k-space while the patient suspends respiration.

1           44. **(NEW)**: The method of claim 42 wherein collecting magnetic resonance  
2           image data further includes using a TR which is less than about 10 milliseconds, a  
3           TE which is less than about 7 milliseconds, and a flip angle which is between about  
4           30° and about 90°.

1           45. **(NEW)**: The method of claim 38 further including imaging at least one  
2           renal artery of the patient by collecting image data which is representative of the  
3           center of k-space while the concentration of the contrast agent in the renal artery is  
4           greater than a concentration of the contrast agent in veins and background tissue  
5           adjacent to the artery.

1           46. **(NEW)**: The method of claim 38 wherein collecting magnetic resonance  
2           image data further includes using a slice thickness which is less than about 4  
3           millimeters and the image volume of the 3D pulse sequence includes at least one  
4           dimension which is at least about 25 centimeters.

1           47. **(NEW)**: The method of claim 38 wherein collecting magnetic resonance  
2           image data further includes collecting image data of the periphery of k-space while

3 the concentration of the contrast agent in the artery is greater than a concentration  
4 of the contrast agent in veins and background tissue adjacent to the artery.

1 48. **(NEW)**: The method of claim 38 wherein determining the arrival time of  
2 a magnetic resonance contrast agent in the region of interest includes estimating the  
3 arrival time based on the physical condition of the patient or the location of the artery  
4 in the patient.

1 49. **(NEW)**: A method of imaging an artery of a patient using a magnetic  
2 resonance imaging system, the method comprising:

3 calculating an arrival time of the contrast agent in the region of interest;

4 injecting a magnetic resonance contrast agent to the patient;

5 correlating collection of magnetic resonance image data which is  
6 representative of the center of k-space with the injection of the magnetic resonance  
7 contrast agent using the arrival time of the contrast agent in the region of interest;

8 collecting magnetic resonance image data, including the image data which is  
9 representative of the center of k-space, using a 3D pulse sequence, wherein at least  
10 a portion of the image data is collected while the concentration of the contrast in the  
11 artery is greater than a concentration of the contrast agent in veins and background  
12 tissue adjacent to the artery.

1 50. **(NEW)**: The method of claim 49 wherein calculating the arrival time of  
2 the contrast agent in a region of interest includes using a test bolus.

1           51. **(NEW)**: The method of claim 49 wherein collecting magnetic resonance  
2 image data includes collecting a substantial portion of the image data while the  
3 patient suspends respiration.

1           52. **(NEW)**: The method of claim 49 wherein collecting magnetic resonance  
2 image data further includes using a TR which is less than about 10 milliseconds.

1           53. **(NEW)**: The method of claim 49 further including imaging at least one  
2 renal artery of the patient by collecting magnetic resonance image data using a 3D  
3 pulse sequence, the image data being collected while the concentration of the  
4 contrast agent in the renal artery is greater than a concentration of the contrast  
5 agent in veins and background tissue adjacent to the renal artery.

1           54. **(NEW)**: The method of claim 49 wherein calculating the arrival time of a  
2 magnetic resonance contrast agent in the region of interest includes calculating the  
3 arrival time based on the physical condition or age of the patient.

1           55. **(NEW)**: The method of claim 49 further including instructing the patient  
2 to suspend respiration while collecting the magnetic resonance image data which is  
3 representative of the center of k-space.

1           56. **(NEW)**: The method of claim 49 wherein collecting magnetic resonance  
2 image data includes collecting image data which is representative of the periphery of  
3 k-space immediately after collecting image data which is representative of the center  
4 of k-space.